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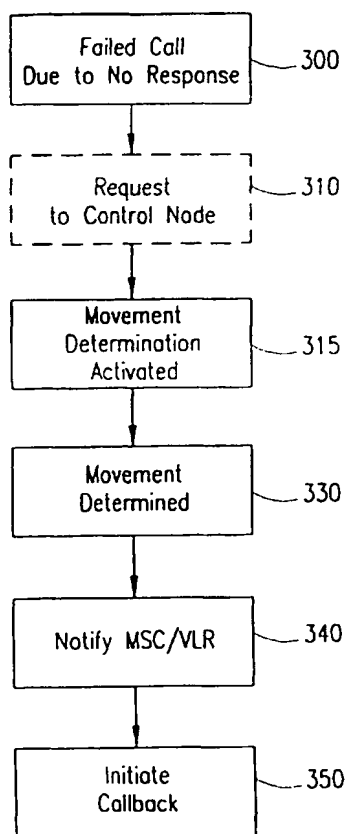
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(54) Title: CALL COMPLETION BASED ON MOVEMENT OF MOBILE STATION



(57) Abstract: A callback service for completing a call from a calling party (201) to a mobile station of a called party (200) that was not previously completed due to no response. After the call was not completed due to no response, the mobile station (200) is monitored to determine if it has moved, and when movement is determined (330) to have occurred, a callback is initiated (350) between the calling party (201) and the called party (200). The movement is a good indication that the called party has moved the mobile station (200) and may therefore be available to receive the call. The movement of the mobile station (200) is preferably determined by detecting that the mobile station has changed its location utilizing mobile positioning technology. The service will generally result in more calls being completed and in their being completed in less time.



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## CALL COMPLETION BASED ON MOVEMENT OF MOBILE STATION

### Background of the Invention

#### 5           1. Field of the Invention

The present invention relates generally to the telecommunications field; and, more particularly, to a method and apparatus for completing a call to a mobile station in a cellular communications network that was not previously completed due to no response.

#### 10           2. Description of the Prior Art

There are a variety of reasons that will prevent a telephone call from being completed. For example, when the party being called (the "called party") is a mobile subscriber, the call may fail because the called party's mobile station (MS) is inactive for some reason. For example, the MS may be turned off, its battery may be dead, or  
15 it may be located in an area that is shielded from radio reception.

In addition, in both wireless and wireline telephone systems, a call may fail because the called party is currently using his phone or MS (i.e., the line is busy); or because the called party may not be near the phone or MS, or is otherwise unable to answer the phone or MS at the time the call is made (i.e., the call is not completed due  
20 to no response).

When a telephone call is not completed, the party making the call (the "calling party") can, of course, simply hang up and call back at a later time. This is generally not a very satisfactory solution to the problem, however, as the calling party usually will not know when the circumstances that prevented the original call from being  
25 completed has been corrected or changed. As a result, it is not uncommon that the calling party may have to make several calling attempts before the call is finally completed or until he abandons the effort.

Recognizing the above problem, and in an effort to provide greater convenience to their subscribers, and to increase revenues as well; both wireline and  
30 wireless telephone service providers offer a variety of supplementary services to their

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subscribers. For example, both wireless and wireline systems offer voice mail services; and if the called party subscribes to such a service, an uncompleted call will be automatically routed to voice mail. A disadvantage of this service, however, is that the called party may not access his voice mail for a period of time, and this can cause problems in situations where the purpose of the call was time-sensitive.

Both wireline and wireless telephone service providers also offer various types of callback services for use in situations where a call is not completed due to the line being busy or because of no response. When the line is busy, the callback services are typically designed to effect a call back when the line is no longer busy, i.e., when the called party completes the current call and thus becomes available for the callback. This is a reasonable approach when the call is not completed because of a busy signal, because it is likely that the called party is present and available when the callback is made inasmuch as a current call has just been completed.

Such an approach is not appropriate, however, when the call was not completed due to no response. In such a situation, the probable reason that the call was not completed is that the called party is not near the phone or MS or is otherwise not available to answer the phone or MS. In order for a callback feature to be at all effective when the call was not completed due to no response, therefore, the status of the called party must first be observed and determined. Specifically, it must first be determined that the called party is, at least probably, near the phone or MS so that when the callback is made, the called party will be available for the call. One indication of the presence of the called party is that he use his telephone or MS. When he has just used the phone or MS to make or receive a call, it is likely that he is available and the callback is automatically made as soon as he hangs up.

A disadvantage of this approach, however, is that it might be some time before the called party uses the telephone or MS. There may also be a time limit on the duration of the wait for the call to be completed, or the calling party may cancel the order to have the call completed before it can be completed.

In general, whenever a possibly successful call is not set-up, the service provider loses revenue (in systems where billing commences at B-answer). In addition, any unsuccessful attempt to complete a call also involves the use of switch

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and radio resources, again without any revenue being received by the service provider. Also, as indicated above, there is, at the least, substantial inconvenience to both the calling party and the called party when a desired call is not completed.

5     **Summary of the Invention**

The present invention provides a call completion service for completing a call to a mobile station in the situation where a previous call is not completed due to no response (This is sometimes referred to as Call Completion on No Reply or CCNR.).

10     In accordance with the invention, a method is provided for completing a call from a calling party to a mobile station of a called party that was not previously completed because of no response by the called party. The method comprises the steps of determining that the mobile station has moved; and, thereafter, initiating a callback between the calling party and the called party.

15     The present invention recognizes that when a call to a mobile station is not completed due to no response, it is usually because the subscriber cannot reach the MS while alerting is on or because the subscriber is not within hearing distance of the MS; e.g., he has left the MS in one location and has moved to another location. The present invention also recognizes that after a no response condition is encountered, if the MS moves, it is likely that the called party has moved the MS; and, therefore, may now be  
20     in a position to receive a call. Under such circumstance, therefore, a callback is initiated with a good possibility that the call will be completed.

According to a presently preferred embodiment of the invention, the determination that the MS has moved comprises detecting that the MS has changed its position or location; and this can be accomplished in various ways. For example,  
25     the detection can be made by utilizing an external system such as the Global Positioning System (GPS); or, alternatively, the detection can be made within the cellular system itself utilizing various procedures including detecting movement of the MS from one cell to another or monitoring received signal strength from the MS.

30     According to a presently preferred embodiment, however, detection of movement of the MS is made utilizing mobile positioning technology that has been developed in recent years for various purposes, including, for example, to locate or

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position emergency vehicles to improve response time to emergency calls, and to improve fleet management (e.g., for taxi companies and the like). Examples of mobile positioning technology include those utilizing downlink solutions (based on measurements made by the MS), uplink solutions (based on measurements made by the base station), and combined uplink and downlink solutions. Copending U.S. Patent Application Serial No. 09/280,233 filed on March 29, 2000, and assigned to Telefonaktiebolaget L M Ericsson (publ), and incorporated herein by reference; generally describes the above and other techniques for detecting the position of an MS.

10 According to embodiments of the invention, the movement of the MS can be considered as only one of two or more inputs that must be satisfied before the decision is made to initiate a callback. Specifically, even though movement of the MS is a good indication that the called party may be available to complete the call, it is possible that the called party may not be near the MS even though it has moved. To  
15 increase the confidence level and to minimize disturbance of the calling party, another input might include receiving an answer from the MS before routing the call to the calling party.

According to yet other embodiments of the invention, the determination that a called MS has moved can be one of two or more conditions under which a callback is initiated. For example, a second condition can be that the called MS has been used  
20 to make or receive a call, as described above; and the callback procedure can be initiated as soon as any one of the two or more conditions is satisfied.

An important aspect of the present invention is that the call completion procedure can be provided as a new subscription service to subscribers, and thus serve  
25 as a new source of revenue to service providers, in addition to providing increased revenue because more calls will be completed. The service can also be provided to either the called party or the calling party.

Also, as in many subscription services, a variety of options can be included in the service as determined by the provider and/or by the subscriber. Such options can  
30 include, for example, limiting the frequency and/or number of attempts to complete the call, providing the ability to cancel the request to complete a call at any time, and

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specifying the period of time that the service remains active. Particularly when the calling party is provided with the service, other options may include providing the calling party with the ability to check the details and status of uncompleted calls, requesting whether or not the calling party wants the callback service activated when  
5 a call receives no response, and the like.

In general, the present invention provides a new call completion service for completing a call to an MS once no response is encountered. The new service reduces the time it takes to complete a call once a no response situation is encountered; and, generally, increases the likelihood that the call will be completed. The service,  
10 accordingly, will result in an increased number of completed calls, a potential for increased revenue by the service provider and greater convenience to the subscriber.

The above and further advantages, objects and features of the invention will become apparent hereinafter in conjunction with the following detailed description of presently preferred embodiments thereof.

15

### **Brief Description of the Drawings**

Fig. 1 is a block diagram illustrating a conventional cellular network to assist in explaining the present invention;

Fig. 2 is a block diagram schematically illustrating an apparatus for effecting  
20 a callback on no response according to a presently preferred embodiment of the invention;

Fig. 3 is a flow chart illustrating the steps for effecting the callback on no response according to a presently preferred embodiment of the invention; and

Figs. 4 and 5 are flow charts illustrating alternative embodiments of the present  
25 invention.

### **Detailed Description of Presently Preferred Embodiments**

Fig. 1 schematically illustrates a conventional cellular network to assist in explaining the present invention. More particularly, Fig. 1 illustrates a Global System for Mobile Communications (GSM) Public Land Mobile Network (PLMN), such as  
30 wireless network 10. The network 10 is composed of a plurality of areas 12, each with

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a Mobile Switching Center (MSC) 14 and an integrated Visitor Location Register (VLR) 16 therein. The MSC/VLR areas 12, in turn, include a plurality of location areas (LA) 18, which are defined as that part of a given MSC/VLR area 12 in which a mobile station (MS) 20 may move freely without having to send update location information to the MSC/VLR that controls the LA 18. Each LA 18 is further divided into a plurality of cells 22. The MS 20 is the physical equipment, e.g., a car phone or other portable phone, used by mobile subscribers to communicate with the cellular network 10, each other, and with users outside the subscribed network, both wireline and wireless.

The MSC 14 is in contact with at least one Base Station Controller (BSC) 23, which, in turn, is in contact with at least one Base Transceiver Station (BTS) 24. The BTS is the physical equipment, illustrated as a radio tower in Fig. 1, that provides radio coverage to the cell 22 for which it is responsible. The BSC 23 may be connected to several BTS's 24, and may be implemented as a stand-alone node or integrated with the MSC 14. In any event, the BSC 23 and BTS 24 components as a whole are generally referred to as a Base Station System (BSS) 25. It should also be noted that the BSC 23 functionality can be included within the MSC 14 instead of being implemented as a separate node as shown in Fig. 1.

As shown in Fig. 1, the PLMN Service Area or cellular network 10 further includes a Home Location Register (HLR) 26, which is a database maintaining all subscriber information such as user profiles, current location information, International Mobile Subscriber Identity (IMSI) numbers, and other administrative information for subscribers registered within the PLMN 10. The HLR 26 may be co-located with a given MSC 14, integrated with the MSC 14, or can service multiple MSCs as is shown in Fig. 1.

The VLR 16 is a database containing information about all the mobile stations currently located within the MSC/VLR area 12. If an MS roams into a new MSC/VLR area, the VLR connected to that MSC will request data about that MS from its home HLR database 26 (simultaneously informing the HLR 26 about the current location of the MS 20). Accordingly, if the user of the MS 20 then wants to make a call, the local VLR will have the requisite information without having to interrogate



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the home HLR 26. In this manner generally, the VLR and HLR databases, respectively, contain various subscriber information associated with a given MS 20.

Fig. 2 is a block diagram illustrating an apparatus (generally designated by reference number 225) for effecting a callback on no response according to a presently preferred embodiment of the invention; and will be described in conjunction with Fig. 3 which is a flow chart illustrating the steps of the procedure for effecting the callback on no response.

Fig. 2 illustrates a mobile station (MS) 200 of a called party and a calling unit 201 of a calling party. The calling unit 201 may also be a mobile station as illustrated in the Fig., and as described hereinafter; or it may be a telephone in a wireline system. In the following description, it is assumed that the calling party has made an attempt to call the called party's MS 200 from calling unit 201; and it is further assumed that the call attempt has failed due to no response by the called party, i.e., the called party did not answer the MS 200 (step 300 in Fig. 3). In addition, it is assumed that either the calling party or the called party subscribes to or is otherwise provided with a callback on no response feature on his MS. This is shown in Fig. 2 by the CCNR (Call Completion on No Reply) block 210 within the MSC/VLRs servicing the called and calling Mss, respectively.

In this regard, inasmuch as the call completion on no response feature is contemplated as being provided as a subscription service, the subscribing MS must have a subscriber property 215 associated with it that identifies it as being capable of requesting activation of the callback on no response feature 210. For example, when the calling MS 201 first enters the area associated with its respective MSC/VLR 206, this property can be downloaded to the MSC/VLR 206 from a subscriber record within the HLR associated with the MS 201. Similarly, when the called MS 200 first enters into the area associated with its respective MSC/VLR 205, this property can be downloaded to the MSC/VLR 205 from a subscriber record within the HLR associated with the called MS 200.

The MSC/VLR 205 of the called MS 200 also includes a movement determination unit 230, and when the call is not completed due to no response (step 300), the movement determination unit 230 is activated (step 315) to monitor the MS

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200 for movement. If it is the calling party that is provided with the callback on no response feature, a request will first be sent from the MSC/VLR 206 responsible for MS 201 to the MSC/VLR 205 responsible for the called MS 200 to activate the unit 225 (this request is shown as a dashed block 310 in Fig. 3).

5           When movement of the called MS 200 is determined to have occurred (step 330), the MSC/VLR 205 is notified (step 340) and starts processing the callback in an effort to complete the original uncompleted call (step 350). Specific procedures by which the callback may be accomplished are well-known to those skilled in the art; and, therefore, are not described herein. In any event, the present invention is not  
10           limited to any particular type of callback procedure. As is also well-known to those skilled in the art, the MSC/VLRs 205 and 206 of the called and calling MSs are able to communicate with one another as necessary to transmit necessary information back and forth to permit the callback to be made. This is illustrated by line 235 in Fig. 2.

          As mentioned previously, in a callback on no response procedure, it is  
15           necessary to observe the status of the called party in order to determine when he becomes available to complete the call. In existing systems, this is typically accomplished by monitoring when the called party has either just placed or just received another call, as this is a good indication that the called party is available to complete the callback. As also indicated above, however, since it may be some time  
20           before the called party uses his phone or MS, the call may not be completed until then.

          The present invention, on the other hand, recognizes that the main reason why a called party does not answer a call on a mobile station is because the party cannot reach the MS while alerting is on or because the MS is not within hearing distance. In view of such circumstances, the present invention also recognizes that if, after a call  
25           to an MS has failed because of no response, the MS is determined to have moved, there is a substantial possibility that the called party has moved the MS and, therefore, that he is now available to complete the call.

          Therefore, in accordance with the present invention, movement determination unit 225 is provided in the MSC/VLR 205 associated with the called party's MS 200  
30           to monitor the movement of the MS 200 once a call that is awaiting completion due to no response has been encountered; and when such movement has been determined

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to have occurred, the callback procedure is initiated.

The present invention contemplates that the determination of movement can be accomplished in various ways; however, in general, the determination according to presently preferred embodiments involves detecting that the mobile station has  
5 changed its location or position. According to presently most preferred embodiments, the detection utilizes mobile positioning technology that has been developed in recent years for various applications..

A variety of mobile positioning techniques have been developed including those disclosed in copending U.S. patent application Serial No.09/280,233 referred to  
10 previously. These techniques include downlink solutions wherein the MS measures signals transmitted by the Base Station, uplink solutions wherein the Base Station measures a signal transmitted by the MS, and combined uplink/downlink solutions. Any of these techniques may be used in the present invention, and the specific technique used depends generally on the resolution desired; i.e., on the amount of  
15 movement of the mobile station desired before making the determination the mobile station has actually moved. In general, the various mobile positioning technologies are known to those skilled in the art and need not be described in any detail herein.

In addition to mobile positioning technologies as described above, other techniques may also be used to detect that the MS has changed its position. These  
20 include, but are not limited to:

1. Global Positioning System (GPS) techniques wherein a GPS receiver can be included in the MS.
2. The mobile station performs a periodic registration in a cell different from where the mobile station was located when the caller did not receive a reply;
- 25 3. The mobile station performs a location registration update (i.e., the mobile station has moved to a new LA);
4. By periodically paging the mobile station in the cell it was originally located in. No response from the mobile station is an indication that it has moved elsewhere. In this embodiment, more than one page without response may be needed to increase  
30 the confidence in the indication that the mobile station is not in the original cell, and confirmation that the mobile station has moved may be obtained by paging other cells;

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Each of the above techniques 2-4 are based on movement from one cell to another. If a shorter distance determination is desired, then differences in received signal strength values can be used. An example of the type of measurement that could be used in this embodiment is MACA (Mobile Assisted Channel Allocation).

5       Signal strength measurements could also be used to determine where the mobile station has moved when on the border of a cell or whether the mobile station has camped in another cell without probably moving.

10       Irrespective of the mobile positioning technique utilized, and it is not intended to limit the invention to any particular technique, once the mobile station is determined to have moved, the MSC/VLR 205 informs the node responsible for establishing the call so that a callback may be made in an effort to complete the call.

In general, the monitoring of the called MS 200 to determine if it has moved will be done on a periodic basis as determined by the MSC/VLR 205.

15       Once it is determined that the mobile station has moved, an attempt can be made to complete the call as indicated above. It is possible, however, that the called party will still not be near the MS even though it has moved. For example, this could occur when the called party has left his MS 200 on a seat in a moving train and moved to a different location on the train. In view of the possibility that the MS can move without the called party being present, in accordance with an alternative embodiment  
20       of the invention, the movement of the MS can be treated as only one of two or more inputs into the decision to initiate the callback procedure. This is illustrated in Fig. 4 wherein before initiating the callback procedure at step 350, one or more other inputs must be satisfied in block 345 in addition to the input of detection of a movement determination.

25       In one possible implementation of this embodiment, first receiving an answer from the called MS 200 could be required before routing the call to the original calling MS 201. This mode will also help to minimize the disturbance on the original calling party.

30       According to yet a further embodiment of the invention, the determination that the called MS 200 has moved can be only one of a plurality of conditions under which a callback procedure is initiated. For example, as shown in Fig. 5, another condition

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can be that the called MS 200 has been used either to make or receive a call as indicated by block 360. Yet other possible condition(s) are indicated by block 370 The callback may be initiated when any one of the plurality of conditions occurs so as to help ensure that the callback will be initiated as soon as possible

5           It is also contemplated by the present invention that the callback service could include various restrictions or options that can be provided by the service provider or that can be selected by the subscriber. For example, a time limit can be set after which the callback feature will be canceled. This is illustrated by timer 245 in MSC/VLR 205. Also, a limit can be placed on the number of call back attempts or the frequency  
10 of the attempts that are made after movement is determined to have occurred and completion of the call is still not made. Also, if desired, a procedure can be provided whereby the calling party is advised that the call is now capable of being completed even if the party is on another call so that he may interrupt the current call if he desires.

15           Yet other possible features include the ability to check the details and status of uncompleted calls, the ability to cancel the request for completion of uncompleted calls at any time and the ability to activate or deactivate the service whenever desired.

          If it is the calling party that is provided with the callback on no response feature, the system can also include the ability to ask the calling party if he wishes the  
20 feature activated when the call has not been completed. In this regard, the MSC/VLR 206 of the calling party accesses an announcement machine 250 asking the calling party whether he would like to activate the feature. The calling party can respond by pressing one or more keys on his MS 201. If he does not wish to activate the service, the call is disconnected. If he does wish to activate the service, an appropriate message  
25 is sent to MSC/VLR 205.

          In general, it is contemplated that the callback on no response feature according to the present invention be incorporated into a call completion service to provide an additional source of revenue to the service provider and to provide an additional service and added convenience to the subscriber. The call completion  
30 service according to the invention will generally result in more calls being completed and in their being completed in less time.

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While what has been described constituted presently preferred embodiments of the invention, it should be understood that the invention could take numerous other forms. Accordingly, it should be recognized that the invention should be limited only insofar as is required by the scope of the following claims.

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What is claimed:

- 5           1. A method for completing a call from a calling party to a mobile station (MS) of a called party that was not previously completed because of no response by the called party, comprising:
  - determining that the MS of the called party has moved; and
  - thereafter initiating a callback between the calling party and the called party.
- 10           2. The method according to claim 1, wherein said determining step comprises detecting that the MS of the called party has changed its location.
- 15           3. The method according to claim 2, wherein said detecting step comprises detecting that the MS of the called party has changed its location utilizing mobile positioning technology.
- 20           4. The method according to claim 1, and further including, before the step of initiating a callback, deciding whether a callback should be initiated even though it has been determined that the MS of the called party has moved.
- 25           5. The method according to claim 4, wherein a decision of said deciding step is based on one input determining that the MS of the called party has moved and at least one other input indicative that the callback may be successful.
- 30           6. The method according to claim 5, wherein said at least one other input comprises that the MS of the calling party answers a call.
7. The method according to claim 1, wherein the determination that the MS of the called party has moved is one of at least two conditions wherein a callback is initiated, and wherein said step of initiating a callback is made if any one of said at least two conditions is satisfied.

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8. The method according to claim 7, wherein another of said at least two conditions is that the MS of the called party has been used to receive or make a call.

5 9. The method according to claim 1, wherein said method is provided in a call completion service, and wherein said service is available to either of the called party or the calling party.

10 10. The method according to claim 9, wherein, when said service is subscribed to by said calling party, the method further includes the step of inquiring if the calling party wants a callback initiated.

15 11. The method according to claim 1, and further including the step of canceling the callback if the determining step does not determine that movement has occurred in a set period of time.

12. . Apparatus for implementing a callback on no response feature when a call from a calling party to a mobile station (MS) of a called party is not completed due to no response, said apparatus comprising:

20 a movement determination unit for determining that the MS of the called party has moved; and

a callback initiating unit for thereafter initiating a callback between said calling party and said called party.

25 13. The apparatus according to claim 12, wherein said movement determination unit comprises a detection unit for detecting that the MS of the called party has changed its location.

14. The apparatus according to claim 13, wherein said detection unit utilizes mobile positioning technology.

30

15. A callback service for completing a call from a calling party to a mobile



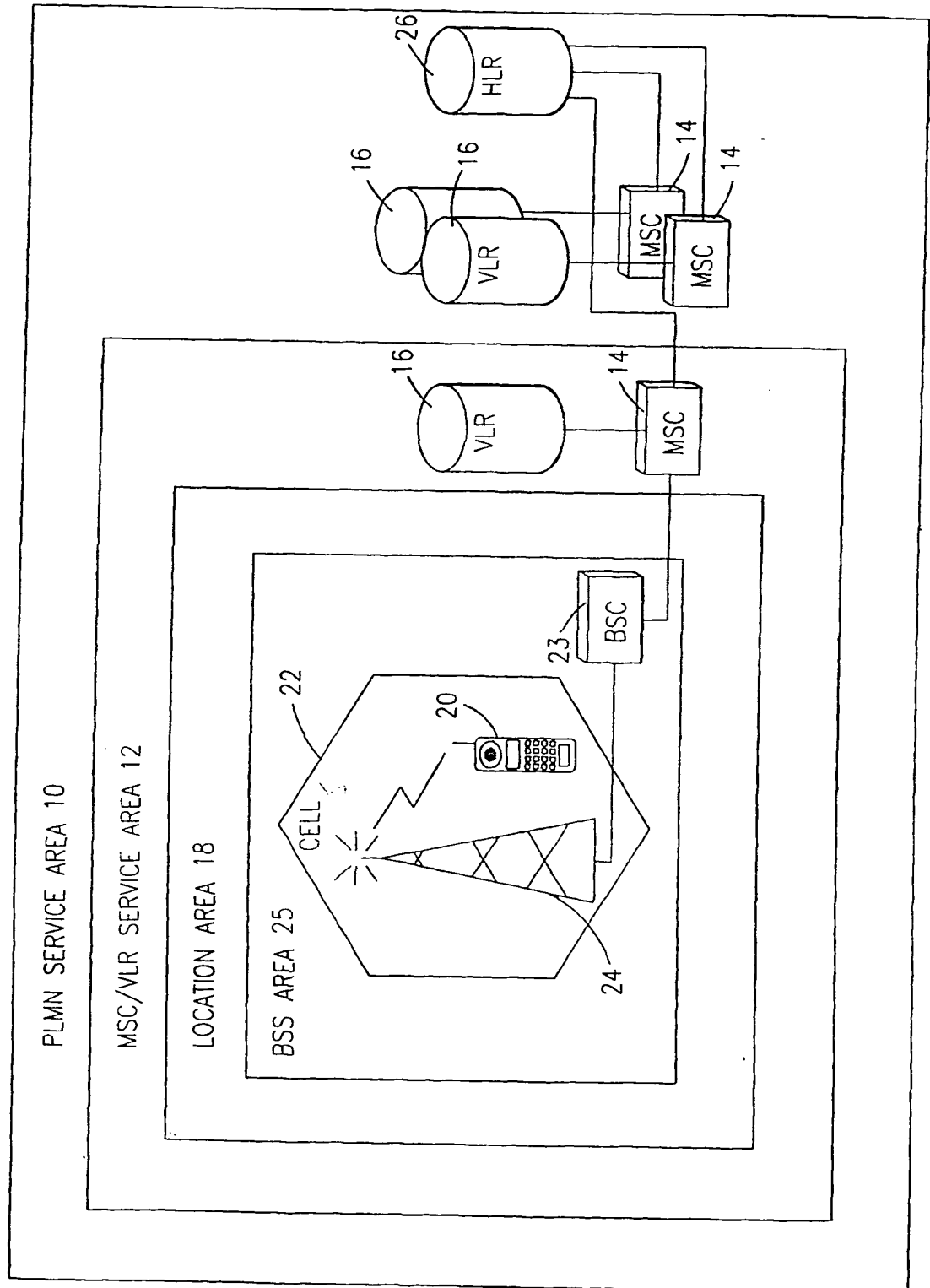
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station of a called party that was not completed due to no response by the called party, said service providing a movement determination unit for determining that the MS of the called party has moved, and a callback initiating unit for initiating a callback between the calling party and the called party after the MS of the called party is  
5 determined to have moved.

16. The calling service according to claim 15, wherein said service is available to either the calling party or the called party.

10 17. The service according to claim 15, wherein said service includes one or more options which may be selected by the subscriber and/or a provider of said service.

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**FIG. 1**  
(PRIOR ART)

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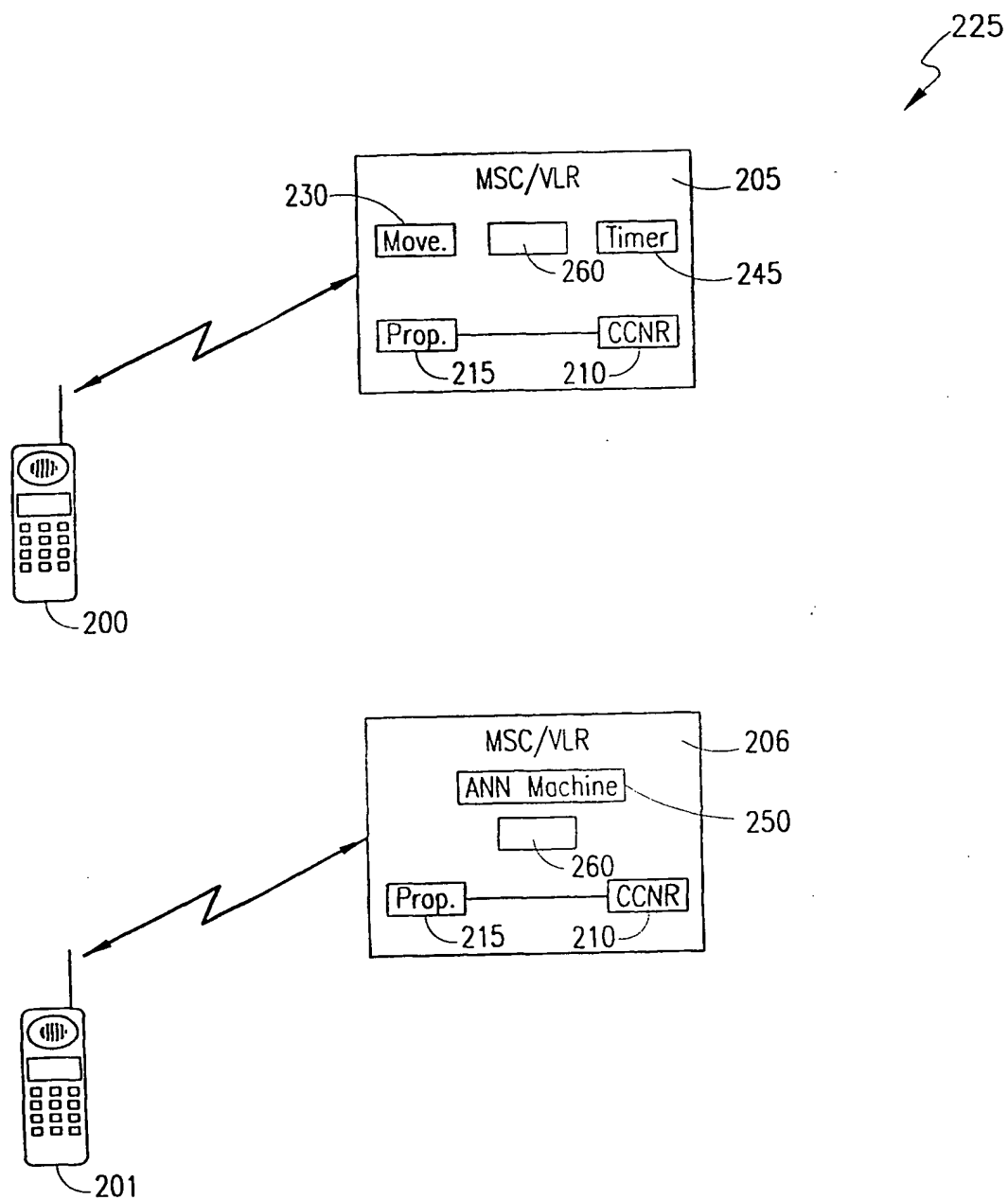
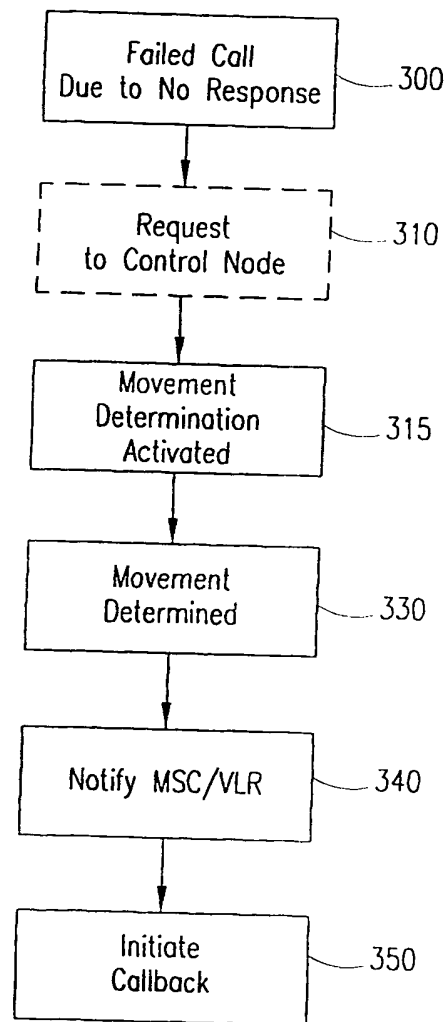
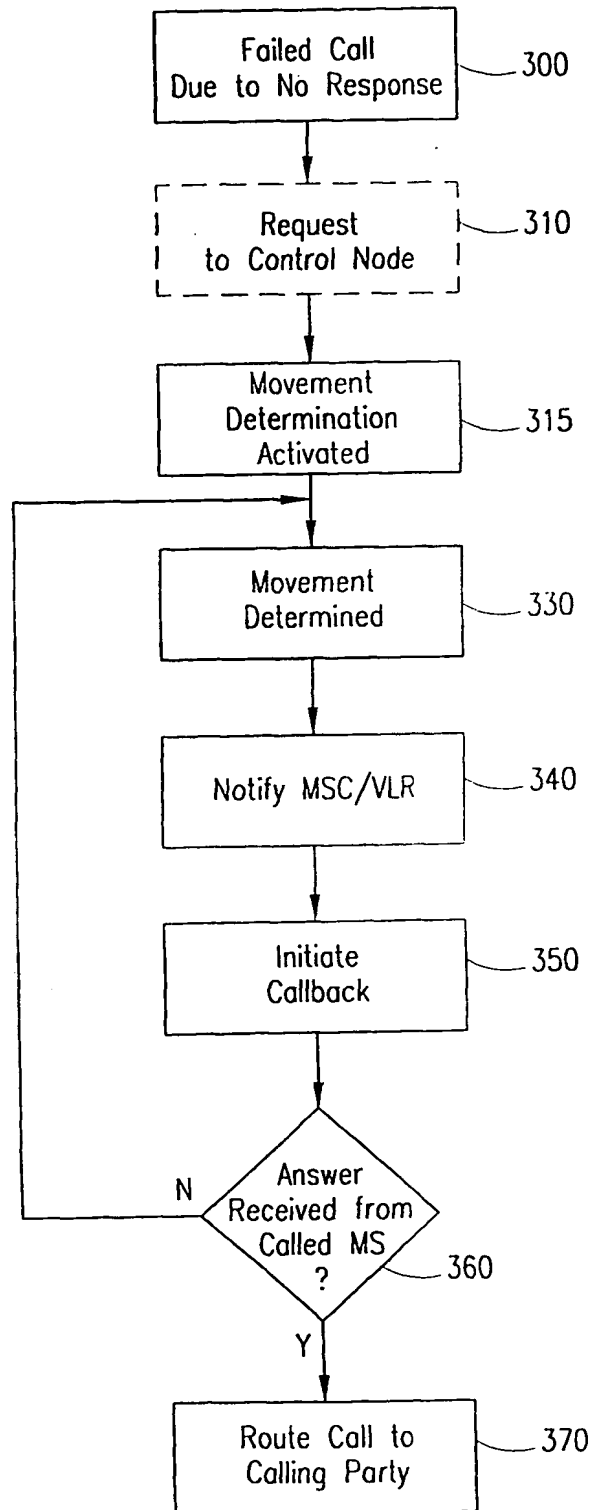


FIG. 2

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*FIG. 3*

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**FIG. 4**

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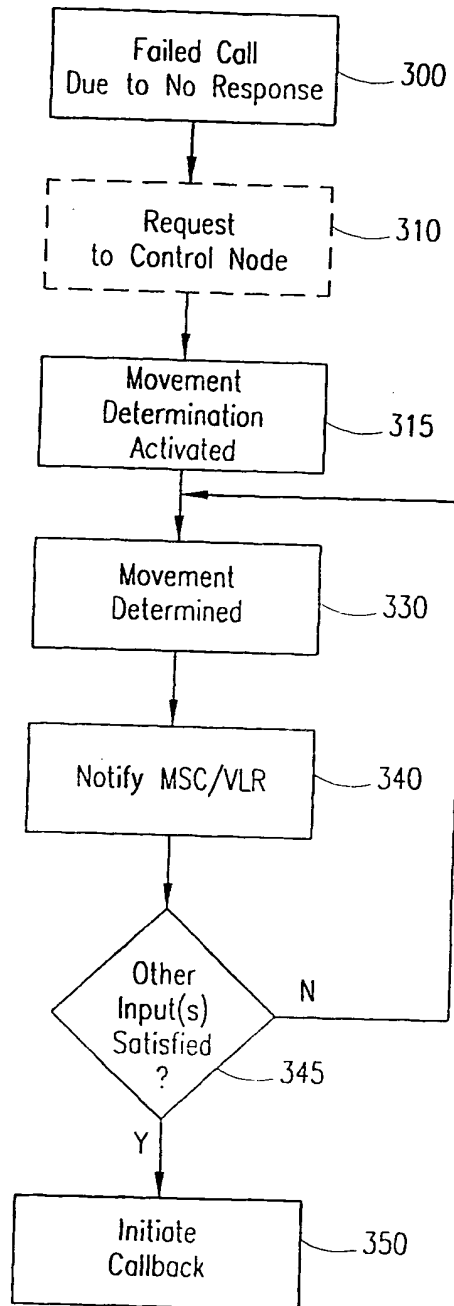


FIG. 5

## INTERNATIONAL SEARCH REPORT

Intern:      pplication No  
PCT/SE 01/02799

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7    H04Q7/38    H04M3/48

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7    H04Q    H04M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6 154 644 A (MURRAY JAMES R) 28 November 2000 (2000-11-28) column 1, line 47 -column 2, line 45 ---	1-17
A	US 5 995 848 A (NGUYEN VIET ANH) 30 November 1999 (1999-11-30) column 2, line 48 -column 3, line 58 -----	1-17



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

## \* Special categories of cited documents :

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \*S\* document member of the same patent family

Date of the actual completion of the international search

4 February 2002

Date of mailing of the international search report

11/02/2002

Name and mailing address of the ISA

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

Intern: Application No

PCT/SE 01/02799

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
US 6154644	A	28-11-2000	AU WO	6016099 A 0014991 A1	27-03-2000 16-03-2000
US 5995848	A	30-11-1999	AU WO	8363098 A 9905876 A1	16-02-1999 04-02-1999





INVESTOR IN PEOPLE

Application No: GB0327566.6

Examiner: Gareth Griffiths

Claims searched: 1-15

Date of search: 20 April 2004

## Patents Act 1977: Search Report under Section 17

### Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular reference
A	-	WO02/051191 A1 (ERICSSON) whole document
A	-	US6032040 A (CHOY) abstract

### Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

### Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC<sup>W</sup> :

H4L

Worldwide search of patent documents classified in the following areas of the IPC<sup>07</sup>

H04L; H04M; H04Q

The following online and other databases have been used in the preparation of this search report

WPI, EPODOC, JAPIO



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Your ref : JCB/P104281GB  
Application No: GB0327566.6  
Applicant : Samsung Electronics Co Ltd.

Examiner : Gareth Griffiths  
Tel : 01633 814937  
Date of report : 21 April 2004

Latest date for reply:

Page 1/1

## Patents Act 1977

### Combined Search and Examination Report under Sections 17 & 18(3)

#### Lack of clarity

1. In the "Summary of Invention" there are 6 aspects of the invention but only 4 corresponding independent claims. The true scope of the invention is therefore obscured.
2. Claims 1 and 10 do not clearly define the invention. For the invention to work it is essential that the exchange *periodically* transmits an updated telephone number list (figure 5) to the originating terminal.
3. The meaning of the phrase "substantially called" is unclear in claim 10.
4. Claims 8 and 9 do not define essential features of the apparatus necessary to carry out the invention. For example, the terminal has no means for determining when to attempt a callback, and the exchange has no means for periodically transmitting the list to the terminal.



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Your Reference: JCB/P104281GB  
Application No: GB0327566.6

21 April 2004

Dear Sirs

**Patents Act 1977:**  
**Combined Search and Examination Report under Sections 17 and 18(3)**

Latest date for reply:

**2 December 2004**

I enclose two copies of my search and examination report and two copies of the citations.

By the above date you should either file amendments to meet the objections in the report or make observations on them. If you do not, the application may be refused.

**Publication**

I estimate that, provided you have met all the formal requirements, preparations for publication of your application will be completed soon after **25 May 2004**. At this time you will receive a letter confirming the exact date when the preparations for publication will be completed. This letter will also tell you the publication number and date of publication of your application.

**Withdrawal/amendment**

If you wish to withdraw your application before it is published you must do so before the preparations for publication are complete. **WARNING** – after preparations for publication are complete it will NOT be possible to withdraw your application from publication.

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<sup>1</sup>Use of E-mail: Please note that e-mail should be used for correspondence only.



INVESTOR IN PEOPLE

Application No : GB0327566.6

Page 2

21 April 2004

If you wish to file amended claims for inclusion with the published application you must do so before the preparations for publication are completed. If you write to the Office less than 3 weeks before 25 May 2004 please mark your letter prominently:

**"URGENT - PUBLICATION IMMINENT".**

Yours faithfully

Gareth Griffiths  
Examiner

**Important information about combined search and examination**

I also ask that you take note of the following points. These might have a bearing on the future stages of your application because the examination report has been sent to you before your application has been published.

- (a) You may file voluntary amendments before making a full response to my examination report. We will publish with your application any new or amended claims you file voluntarily or as a full response, provided that they are received before preparations for publication are completed. It would help us when you file amendments before publication if you could **prominently indicate** in a covering letter whether or not the amendments are intended as a full response to the examination report.
- (b) If you file a full response to the examination report before your application is published I will consider it as soon as possible. However, if this would disrupt the publication of your application, I would have to delay taking any action until the application had been published. This delay could be up to 3 months, depending upon when we receive your response.
- (c) There is another situation when there might be a delay between you filing a full response and the Patent Office responding to it. This would arise if you met all my objections but your application had not or had only recently been published. I could not report the outcome of my re-examination until I was satisfied that the search was complete for documents published before the priority date of your invention and that anybody interested in the application has had three months following publication of the application to make observations on the patentability of your invention.
- (d) Provided that the requirements of the Act have been met, I can send your application to grant as early as three months after publication. Before doing so I will bring the original search up to date and raise with you any further objection that might result from this top-up search. However, there is a possibility that at that time I may not have access to all the patent applications published after the priority date of your invention and of possible relevance to your application. If this is the case I would have to complete the search after grant and if necessary raise any new found novelty objection then.